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REPORT ON MONITORING COSTS
OF POLLUTION CONTROL INSTALLATIONS
For The
PROCTER AND GAMBLE PULP MILL
AT GRANDE PRAIRIE, ALBERTA

Prepared For

THE GOVERNMENT OF ALBERTA

THE DEPARTMENT OF THE ENVIRONMENT

by

STANLEY ASSOCIATES ENGINEERING LTD.

CONSULTING ENGINEERS

November 1971

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REPORT ON MONITORING COSTS OF POLLUTION CONTROL INSTALLATIONS

For The

PROCTER AND GAMBLE PULP MILL
AT GRANDE PRAIRIE, ALBERTA

DIVISION OF POLLUTION
DEC 3 - 1971

Prepared For
THE GOVERNMENT OF ALBERTA
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by
STANLEY ASSOCIATES ENGINEERING LTD.
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November 1971

Stanley Associates Engineering Ltd.
CONSULTING ENGINEERS

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November 26, 1971
File: 973 - 1/2d

LETTER OF TRANSMITTAL

Mr. H. L. Hogge, Director
Environmental Health Services Division
Department of Health
6th Floor, Milner Building
10040 - 104 Street
Edmonton 14, Alberta.

Dear Sir:

Re: Monitoring of Pollution Control Costs
For Procter and Gamble Pulp Mill

In order to assure that the pollution control costs are monitored to the satisfaction of the Minister and the Provincial Auditor we have prepared this report outlining the information available from Company records and the cost control procedures deemed necessary. By reviewing these proposed cost control procedures at this time it should be possible to detect any areas which require further consideration so that the program fulfills these requirements.

We will be most pleased to provide any additional information required.

Yours truly,
Stanley Associates Engineering Ltd.

G. Bowman

G. Bowman, P. Eng.

GB:lo

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INTRODUCTION:

The objectives of the cost control program to be administered by Stanley Associates Engineering Ltd. can be defined as follows:

(1) To verify actual construction costs of pollution control facilites, to the satisfaction of the Minister and the Provincial Auditor, and to submit interim reports to the Minister on the status of the work.

(2) To compare actual construction costs against estimated costs and advise the Minister of any significant variations or trends.

(3) To verify that the pollution control facilities and equipment are actually provided in accordance with the intent of the revised agreement between Procter and Gamble and the Government of Alberta.

In setting out a program to be used for verification of construction costs associated with pollution control facilities, we have reviewed the type and form of information which would be available from the cost control system established by Procter and Gamble and Canadian Bechtel Limited.

It was deemed desirable to consider the use of the Company's cost records for cost verification, for three basic reasons:

(a) It would avoid duplication of clerical and accounting staff for compiling cost records, and thus reduce the cost of verification.

(b) It would probably create the least possible interference with the construction work..

(c) It would reduce the emphasis on Government financial participation at the field level and probably reduce the amount of biased reporting of cost allocation from field supervisory employees.

The following report outlines the information available from Company records and presents recommendations for procedures which could be utilized within the frame work of the Company control system to achieve the objectives of the Cost Control Program in accordance with the agreement between the Provincial Government and Stanley Associates Engineering Ltd.

Other questions dealing with the general interpretation and philosophy of the revised agreement between Procter and Gamble and the Government of Alberta have been reviewed in previous reports and are presently being resolved by the two parties. Where these general guidelines are dependent on final design, further supporting information will be provided as final working drawings are completed.

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AVAILABLE COST INFORMATION

A. Labor

The large labor force involved in construction of the pulp mill has prompted the Contractor to install computor equipment which will be used for payroll preparation and cost control. The systems used are elaborate and detailed with considerable provision for detecting errors and forecasting areas where costs may exceed the estimates. Following is the flow of labor information which is available from Company records.

(i) Work Orders

All labor costs are allocated to Work Orders as a means of breaking the costs down to reasonable units of work. The Work Orders usually remain open for a maximum period of three months, after which time they are closed and no further costs can be charged. The Work Orders define in detail the work covered and the bogey hours per trade.

(ii) Daily Time Sheets

Daily time sheets are prepared by the crew foreman for each work crew. Crew sizes are generally in the order of ten men. The crew foreman allocates each workman's time to Work Orders indicating the craft and a brief description of the work performed. The time sheets are then checked by an Area Superintendent for correct allocations and by an Area Cost Control Engineer for correct coding. The time sheets are then submitted to the field payroll office where they are checked for special rates. This information is then key punched into the computer and is used for payroll preparation as well as cost control accounting. The daily time sheets are then filed in the field office.

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(iii) Daily Edited Time Sheet:

This is a daily print out which lists each employee by name and badge number and shows each man's time charged to individual Work Orders. This print out is used as a check against gate records and camp records to ensure that the employee was in fact at work and also that his time has not been reported or duplicated by two different foremen.

(iv) Labor Ledger:

This is a weekly print out summarizing labor costs to each Work Order per trade. It further gives the hours and dollars spent during the week as well as the totals to date.

(v) Focus Run:

The Focus Run is a weekly print out of man hours per craft per Work Order and lists hours spent for the week and hours spent to date. It further indicates the performance factor to date as well as the trend forecast.

B. Material and Equipment

Materials are ordered by Procter & Gamble as well as Canadian Bechtel Limited. Some of the material is also purchased by Canadian Bechtel Limited site personnel. Following is a general outline of the information available from Company records on material purchases.

(i) Quotations

Procter & Gamble's purchasing department consider this information confidential and are reluctant to disclose actual bid comparisons. However, Procter & Gamble have indicated that this information could be made available, upon special request provided such information was kept confidential and that the documents were not duplicated.

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(ii) Purchase Orders

Purchase orders which are issued will have a copy filed in the field office commitment file and will be coded as to Sandwell department and detail numbers.

(iii) Line Drawings

These drawings are to be prepared with reference numbers which will indicate piping and equipment which is associated with pollution control. These drawings will provide an intricate means of identification of both materials and equipment which perform a pollution control function.

C. Sub Contracts

(i) Tenders

Tender evaluation is considered to be confidential by Procter & Gamble and is available only on special request and in a confidential manner as outlined for material and equipment quotations.

(ii) Sub Contract Documents

These documents are available for perusal in the Edmonton office as well as the site office, however duplication of documents will be somewhat restricted.

(iii) Quantity Payments

Documents containing quantities of payment will be available for checking purposes.

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D. Site Overhead and General Services

(i) Administrative

All employees above the crew foreman level are charged to overhead as well as general labor associated with site services and miscellaneous material handling. These costs are considered as distributables and are charged as an overhead cost to the project. Only Canadian Bechtel Limited overhead and administrative costs are to be charged and no Procter & Gamble personnel are included.

(ii) General Services

Physical facilities as well as general services such as site power, roads, parking lots and other items not specifically associated with a particular phase of work are also recorded as an overhead cost.

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COST CONTROL PROCEDURES

Procter & Gamble together with Canadian Bechtel Limited have developed an extensive recording and reporting system for their own control information. Working within the bounds of this system the following procedures are considered essential for verification of charges made to pollution control.

A. Labor

Labor allocations on the daily time sheets are the basis used for the determination of labor costs of each phase of work. These allocations are made by a crew foreman who is directly in charge of the workmen and therefore should be familiar with the work performed by each workman under his supervision.

The possibility of human error in coding the daily labor time sheets are considered to be quite distinct however the checking system as set up by Canadian Bechtel Limited should greatly reduce the possibility of errors going unnoticed. Normal procedure for approval of daily labor time sheets for work of this nature would require approval of each time sheet by a government representative. This would require a government representative for each superintendent where pollution control work is being carried out. This would mean that from 6 to 10 representatives would be required for this work alone. This detail checking would also require that these representatives would have to make several checks on the size of work crew being employed each day on every phase of work which includes pollution control items. These daily checks would not only be extremely disruptive to the contractors work but it would also alert all personnel to the fact that coding of time to pollution control is of direct benefit to the Company.

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This awareness of the implications of coding can be detrimental to obtaining an unbiased allocation of costs. It is therefore deemed desireable to perform the coding and crew allocation checks on a random basis so as to eliminate as much direct contact with the workmen as possible and yet assure that an unbiased record of labor costs is being maintained.

Another area of extreme importance is the manner in which Work Orders are set up and coded. This must be done in such a manner that pollution control work can be readily identified with a minimum of interpolation. Labor associated with construction outside the immediate plant area will be readily identified from the coding system as presently set up as it is a separate entity. Similarly where in plant work can be set up so that a Work Order comprises only work which relates to pollution control, cost identification will be straight foreward. However, where pollution control comprises only a portion of a Work Order it will be necessary to establish these applicable costs as a percentage of the total Work Order. Where these costs amount to only one or two thousand dollars it may be desireable to reach agreement on a mutually acceptable estimated cost rather than attempt to arrive at a percentage of the Work Order cost.

The entry of the labor cost information into the computor is an area prone to human error, however, Canadian Bechtel Limited have developed systems which will provide a reasonable check in order to detect such errors. A thorough check of the key punch operation would require a complete duplication of the staff associated with this operation. Since this is primarily a routine operation, a statistical sampling of

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the key punch cards should provide adequate verification and detect a frequency of errors.

The Daily Edited Time Sheet provides an additional means of checking for errors. The Focus Run indicates over runs of costs in intricate detail and can be used to determine areas which require close scrutiny and detailed review of costs.

B. Material and Equipment

Material and equipment is coded by department and detail numbers. In the cases of larger equipment this will be sufficient to determine whether useage is associated with pollution control. In the case of minor equipment, piping, electrical materials and the like which are purchased in lot quantities it will be necessary to refer to the line drawings to determine the runs and equipment items associated with pollution control. Once this has been determined actual sizes and quantities can be obtained from site checks and these related to the invoiced lot quantities.

Where material and equipment costs charged to pollution control are incremental it will be possible to establish the actual cost of the installed equipment however, the cost of the equipment less pollution control features can only be estimated from the preliminary quotation received from suppliers. Where it is not possible to further verify the cost of standard equipment which does not incorporate pollution control features it will be necessary to use the preliminary quotation cost information in arriving at the final incremental costs. In order for the non pollution control cost to have a true relationship to the actual installed cost it is desireable to determine the incremental cost as a percentage of the installed cost. This should be done by

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establishing the percentage increase from the preliminary quotes and taking this percentage of the installed cost as being the incremental cost increase.

C. Sub Contracts

It will be necessary to examine all sub contracts which relate to pollution control in order to confirm that the work does in fact relate to pollution control and also to check quantity payments and unit costs. Since it has been indicated that these documents are available for perusal, verification of chargeable costs should not be difficult. It should also be possible to make physical take offs of payment items and check these against quantity payments. Where work is performed on a day rate basis for sub contract work or extra work, the labor charges would be checked in a manner similar to Canadian Bechtel labor. It is doubtful that these costs would be handled through the computor program and therefore more manual clerical checking would be required. It is not anticipated that there would be much of this day rate labor carried out and therefore this checking should not be time consuming.

D. Construction Equipment

Special construction equipment brought in to perform work on a specific phase of construction should be readily identified from the coding allocations. This cost can be verified from daily records. General construction equipment charges will be allocated as distributables and charged as a percentage over the entire project. This is acceptable for in plant work, however may not apply to off site work particularly where the work is performed by sub contractors.

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E. Site Overhead and General Services

These costs are treated as general overhead and will be charged as percentage over the entire project. This is acceptable for in plant work carried out by Canadian Bechtel Limited forces however, certain of the overhead charges should not apply to sub contract work especially those working outside of the immediate plant area. These overhead costs will therefore be reviewed in this respect so that only applicable overhead charges are accepted.

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CONCLUSIONS

1. The accounting system appears to meet the basic requirements for determining the costs which are associated with pollution control however further detailed examinations of the system are presently being conducted to determine if any modifications can be introduced within the bounds of the present system which would provide more direct identification of pollution control costs.

2. Verification of labor allocations should be carried out in such a manner as to avoid alerting Canadian Bechtel Limited personnel below the area superintendent level as to the purpose of coding pollution control work as a separate item. This should reduce the chance of biased reporting. Random checks on time sheet entries and crew sizes should be adequate to verify labor costs.

3. A detailed check for errors in key punching is not warranted and therefore this should be done on a statistical sampling basis. Such sampling should indicate the frequency of errors and point out any weakness in the present system.

4. Material and equipment can be identified and recorded as committments are made. These costs can be verified every 2 to 3 months as invoices are paid.

5. Incremental costs of pollution control can be established as a percentage of the final installed costs.

6. Construction equipment, general services and site overhead charges must be reviewed to determine whether they are applicable to sub contracts and in particular work performed outside the plant area.

7. Sub contracts can be recorded as awarded and confirmed as payments are made.

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RECOMMENDATIONS

1. Review of the accounting system is continuing in order to determine its adequacy in identifying pollution control costs. This examination has indicated the need for identification coding which can distinguish between pollution control costs that are elligible for accellerated Federal Government tax write off as opposed to those which come under the Alberta Government revised agreement.

2. Due to the magnitude of day labor employed on this project and the detrimental effects of making workmen aware of the cost sharing aspect, it is deemed desirable to spot check only, the daily time sheets and crew allocations. This would be carried out on a random basis.

3. The key punch operation should be checked for errors on a statistical sampling basis rather than by detailed checking.

4. Work Orders must be prepared so that as many as is reasonably possible contain work which is entirely pollution control. The coding for Work Orders must be such that all those containing pollution control items, whether in part or in total, can be clearly identified and that a separate print out can be made of these Work Orders. These Work Orders will then be monitored by Stanley Associates Engineering Ltd. staff.

5. Where a Work Order encompasses both process and pollution control work and the pollution control portion amounts to less than two thousand dollars, mutually agreed estimated costs should be accepted rather than attempting to establish a percentage of the total Work Order labor.

6. Incremental costs of pollution control equipment should be established as a percentage of the final cost of the installed equipment. The percentage should be established using the

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following formula:

$$P = \frac{(A - B)}{A} \times C \quad \text{where}$$

P = Incremental cost to be shared for pollution control equipment

A = Estimated cost of equipment with pollution control features

B = Estimated cost of normal process equipment

C = Actual installed cost of equipment with pollution control features

The term estimated costs refers to the original quotations as outlined in the Procter and Gamble submission.

7. In order to verify pollution control costs it is essential that copies of the following documents encompasing this work be provided for use by Stanley Associates Engineering Ltd. staff.

   (i) Work Orders
   (ii) Work Order print out
   (iii) Daily Time sheets as requested
   (iv) Daily Edited Time sheets as requested
   (v) Labor Ledger
   (vi) Focus Run
   (vii) Material, equipment and sub contract quotation comparissons as requested.
   (viii) Purchase orders and backup invoices
   (ix) Construction drawings and line drawings
   (x) Sub contract documents
   (xi) Quantity take offs for sub contract payment
   (xii) Print outs of destributables and general overhead items

8. Stanley Associates Engineering Ltd. site personnel should have complete access to all areas where construction work is carried out on pollution control work.

9. A full time Stanley Associates Engineering Ltd. representative

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should be located on site in the very near future and additional staff be allocated when equipment installation and piping fabrication is commenced.

10. Stanley Associates Engineering Ltd. will keep a progress statement of all costs to date. This statement will relate all costs to the same format used by Procter & Gamble in their latest submission of cost estimates.

APPENDIX

APPENDIX I

DIRECT MATERIAL

CODE OF ACCOUNTS

CATEGORY DESCRIPTIONS

B.- Buildings

Those structures which, as a major function, can house or shelter personnel as well as equipment, materials or finished product, including those special components which would remain as an integral part of a building structure even if production equipment that dictated the original design were removed. Includes:

Foundations
Excavation
Structural
Closures & Partitions
Finishes
Building Services; i.e. Plumbing
  Heating, Ventilation, Air Conditioning
Fire Protection
Electrical Services
Elevators
Furnishings & Equipment

This classification *excludes* those structures which are of an equipment support or auxiliary nature and would generally be removed if the equipment supported or served by it was removed; e.g.

a) Superstructure steel, stairs, platforms, ladders, lighting, sprinklers, etc., above the roof level. (Include in "Equipment Structures & Foundations").

b) Mezzanines designed basically as equipment supports rather than building additions for added floor area.

c) Non-walk-in type housings for equipment - hoses, fans, generators, etc. All process associated materials such as process piping, instruments, electrical and process equipment foundations are *excluded*.

E - Electrical

Includes all electrical work

from - but not including - the primary power source. (Generating equipment is included with equipment).

thru - and including - the final connection to individual process load. (Load itself is generally a process equipment item.)

Includes power and control equipment (i.e., switchgear and transformers, motor control centers and local control) non-building, lighting, conduit, cable trays, cable, concrete envelope and earthwork.

F - Equipment Structures and Foundations

Miscellaneous non-building structural items including:

a) Foundations, mats, supports, ladders, platforms, mezzanine, walkways associated with equipment.

b) Bridges such as walkways are charged to this category. Bridges supporting piping or conduit exclusively to be charged direct to piping or electrical.

Excludes: grouting
paving
manholes (electrical or sewer)
earthwork for underground piping, sewers, and electrical work
concrete valve pits, pipe anchors and thrust blocks
structural pipe sleeper

N - Instrumentation

Includes the furnishing, installing, testing and calibration of instruments used for the purpose of controlling, measuring, observation, indicating or recording various process variables in the permanent plant facilities. This instrumentation system may be electronic or pneumatic. Also included is the instrument air supply piping from the first blockvalve of an air header to the instruments and weatherproofing, except steam tracing, of these instruments to insure satisfactory operation regardless of climatic conditions.

The material cost of control and relief valves, valve positioners, boosters, valve indicators and regulators is included but the installation labor is included with piping. Also includes single tubing, multi-tube bundles and raceways, miscellaneous piping materials required for installation of the instruments, instrument insulation and instrument shelters including heating coils.

Excluded are conduit and wire, conduit racks, steam tracing, steam and condensate piping to instrument shelter heater coils, instruments supplied as an integral part of a piece of equipment, installation labor for control and relief valves, and orifice flanges and spectacle blinds.

P - Piping

Includes the furnishing, fabricating, installing, testing, and inspection of all process pipe, process steam and process service piping complete with hangers and supports.

Excludes building plumbing, heating, fire protection and sprinklers, temporary facilities, storm sewers, sewage collection, fire protection system and water supply.

Also includes concrete work-valve boxes, etc., earthwork - excavation, trenching, shoring, dewatering, and backfill - stress relieving, steam tracing, pipe sleepers and associated painting and insulation.

Excludes piping supplied as an integral part of a piece of equipment.

Q - Equipment

Includes the material cost for all equipment numbered items including freight, duty, sales tax and vendors representatives. Includes the labor charges for off-loading, handling, erecting, plumbing, shimming, grouting, installation of all internals, testing and inspecting. Includes painting, insulation, fireproofing and instruments when purchased as a package with equipment.

Excludes:
a) Items charged to direct job cost accounts in one of the other major classifications; e.g., compressor for refrigeration system chargeable to building air conditioning, or booster pump or elevated water tank chargeable to yard fire protection.

b) Foundations and supports, chargeable to "Equipment (& Auxiliary) Structures". Minor brackets, hangers, etc., may be charged directly to the Equipment account as a convenience.

S - Yard, Underground and Site Clearance

Generally, this classification includes outdoor work not otherwise covered by Equipment, Process Piping or Electrical classifications. Specifically, Yard, Underground, Site Clearance includes:

Site Grading
Yard Electrical
  Fences and Gates
  Sewers and Drains
Landscaping
Roads - Walks - Mats
Parking Lots
Railroads
Water Supply
Reservoirs & Wells
Yard Fire Protection

U - Pre-Startup Inspection

2) Charges for pre-startup inspection, testing, calibrating including stand-by time.

Excludes:

Initial pipe and instrument testing required by specification.
Stand-by time not directly associated with P.S.I.

Y - Distributable Field Costs

Includes all field work and other field cost items which cannot be directly identified with any specific construction operation for the permanent facilities, that is, with direct account items.

The following general accounts are included:

Temporary Construction Facilities
Miscellaneous Construction Services
Construction Equipment, Tools, Supplies and Utilities
Field Office Supervision and Overhead
Preliminary Operations
Payroll Expenses
Taxes
Other

Job 9103

MATERIAL CODE OF ACCOUNTS

Sandwell Department	Description
111	Site
121	Transportation
131	Sewers
132	Effluent Treatment
141	Fire Protection
211	Office, Laboratories and Personnel Services
221	Mill Stores
231	Maintenance Shops
261	Fuel Storage & Handling
271	Water Supply & Distribution
272	River Pumphouse & Pipelines
281	Steam Supply & Distribution
291	Power Supply & Distribution
311	Wood Yard
321	Wood Room
322	Chip Screening
411	Digester Plant
421	Washing & Screening Plant
431	Bleach Plant
451	Evaporator Plant
461	Recovery Boiler Plant
471	Causticizing Plant
481	Lime Reburning Plant
621	Chlorine Dioxide Plant
851	Plup Drying Machine
871	Finishing Plant
891	Pulp Warehouse

P & G GRANDE PRAIRIE PULP MILL

Job 9103

CODE OF ACCOUNTS

Area Identification

Area	Sandwell Dept. No.	Department
1		Power & Recovery Boiler Bldg.
	281	Steam Supply & Distribution
	291	Power Supply & Distribution
	451	Evaporator Plant
	461	Recovery Boiler Plant
	471	Causticizing Plant
	481	Lime Burning Plant
2		Pulp Making Building
	411	Digestor Plant
	421	Washing & Screening Plant
	431	Bleach Plant
	621	Chlorine Dioxide Plant
3		Pulp Drying & Finish Plant Bldg.
	211	Offices, Labs, & Personnel Fac.
	221	Mill Stores
	231	Maintenance Shops
	851	Pulp Drying Machine
	871	Finishing Plant
	891	Pulp Warehouse
4		Offplot
	111	Site
	121	Transportation
	131	Sewers
	132	Effluent Treatment
	141	Fire Protection
	261	Fuel Storage & Handling
	271	Water Supply & Distribution
	272	River Pumphouse
	311	Wood Handling & Storage
	321	Wood Preparation Plant
	322	Chip Screening Plant
7	( )	Distributables

Note: Distributables charged to Area 7 are those costs not directly chargeable to Areas 1 - 4 and will be spread at a later date, e.g. 7-Y-911L

Distributables identified to an Area will be charged directly to that Area, e.g. 1-Y-911L.

MATERIAL COST CODES

Civil and Structural Items

DETAILS

DEPARTMENT 111 - Site

	Description
111.54	Clearing
111.55	Mass Excavation & Fill
111.56	Grading and Drainage
111.58	Compaction and Consolidation
111.61	Fencing
111.62	Guardhouse
111.64	Rip Rap
111.68	Yard Lighting
111.69	Landscaping

DEPARTMENT 121 - Transportation

121.81	Off-site Road Improvement
121.82	New Roads
121.83	Paving, Roads and Parking
121.84	Drainage
121.85	Railway Outside Mill Yard
121.86	Railway- Inside Mill Yard
121.87	Scale House
121.88	Garage
121.89	Locomotive Shed

DEPARTMENT 131 - Sewers

131.11	Excavation
131.13	Concrete
131.14	Structural & Misc. Metals
131.16	Siding
131.17	Masonry
131.18	Roofing
131.22	Painting
131.24	Plumbing & Roof Drains
131.25	Space Heating & Ventilation
131.26	Lighting & Electrical Services
131.27	Apertures
131.51	Sanitary Sewers
131.52	Storm Sewers
131.62	Process Sewers

MATERIAL COST CODES

Civil and Structural Items - DETAILS

DEPARTMENT 132 - Effluent Treatment

132.81	Mixing Chamber
132.82	Clarifier
132.83	Sludge Filter Building
132.84	Spill Pond
132.85	Lagoon
132.86	Final Aeration & Monitor (Including Foam Control)

DEPARTMENT 141 - Fire Protection

141.11	Excavation and Fill
141.13	Concrete

DEPARTMENT 211 - Offices, Laboratories and Personnel Services

211.11	Excavation
211.13	Concrete
211.14	Structural & Misc. Metals
211.15	Structural & Misc. Timber
211.17	Masonry
211.18	Roofing
211.21	Interior Finishing
211.22	Painting
211.23	Interior Fire Protection
211.24	Plumbing & Roof Drains
211.25	Spare Heating & Ventilation
211.26	Lighting
211.27	Apertures

DEPARTMENT 231 - Maintenance Shops

231.11	Excavation and Fill
231.13	Concrete
231.14	Structural & Misc. Metals
231.15	Structural & Misc. Timber
231.16	Siding
231.17	Masonry
231.18	Roofing
231.21	Interior Finishing
231.22	Painting
231.23	Interior Fire Protection
231.24	Plumbing and Drains
231.25	Heating and Ventilating
231.26	Lighting
231.27	Aperture

MATERIAL COST CODES

Civil and Structural Items - DETAILS

DEPARTMENT 261 - Fuel Storage and Handling

261.11	Excavation and Fill
261.13	Concrete

DEPARTMENT 271 - Water Supply and Distribution

271.11	Excavation and Fill
271.13	Concrete
271.14	Structural & Misc. Metals
271.16	Siding
271.17	Masonry
271.18	Roofing
271.21	Interior Finishing
271.22	Painting
271.24	Plumbing & Drains
271.25	Heating & Ventilatig
271.26	Lighting
271.27	Apertures

DEPARTMENT 272 - Water Pumphouse

272.11	Excavation and Backfill
272.13	Concrete
272.14	Structural & Misc. Metals
272.17	Masonry
272.18	Roofing
272.21	Interior Finishing
272.22	Painting
272.23	Interior Fire Protection
272.26	Lighting and Elec. Services
272.27	Apertures

DEPARTMENT 291 - Power Supply and Distribution

291.00	Main Substation Complete

MATERIAL COST CODES

Civil and Structural Items - DETAILS

DEPARTMENT 311 - Wood Yard

311.11	Excavation and Fill
311.13	Concrete
311.14	Structural & Misc. Metals
311.15	Structural & Misc. Timber
311.16	Siding
311.17	Masonry
311.18	Roofing
311.21	Interior Finishing
311.22	Painting
311.23	Interior Fire Protection
311.24	Plumbing & Roof Drains
311.25	Space Heating & Ventilation
311.26	Lighting
311.27	Apertures
311.28	Asphalt Surfacing
311.30	Truck cleaning station

DEPARTMENT 321 - Wood Room

321.11	Excavation and Fill
321.13	Concrete
321.14	Structural & Misc. Metals
321.15	Structural & Misc. Timber
321.16	Siding
321.17	Masonry
321.18	Roofing
321.21	Interior Finishing
321.22	Painting
321.23	Interior Fire Protection
321.24	Plumbing & Roof Drains
321.25	Space Heating & Ventilation
321.26	Lighting
321.27	Apertures

DEPARTMENT 411 - Digester Plant

411.11	Excavation and Fill
411.13	Concrete
411.14	Structural & Misc. Metals
411.15	Structural & Misc. Timber
411.16	Siding
411.17	Masonry
411.18	Roofing
411.21	Interior Finishing
411.22	Painting
411.23	Interior Fire Protection
411.24	Plumbing & Roof Drains
411.25	Space Heating & Ventilation
411.26	Lighting
411.27	Apertures

MATERIAL COST CODES

Civil and Structural Items - DETAILS

DEPARTMENT 461 - Recovery Boiler Plant

461.11	Excavation andFill
461.13	Concrete
461.14	Structural & Misc. Metals
461.15	Structural & Misc. Timber
461.16	Siding
461.17	Masonry
461.18	Roofing
461.21	Interior Finishing
461.22	Painting
461.23	Interior Fire Protection
461.24	Plumbing & Roof Drains
461.25	Space Hearing & Ventilation
461.26	Lighting
461.27	Apertures

DEPARTMENT 471 - Causticizing Plant

471.11	Excavation and Fill
471.13	Concrete
471.14	Structural & Misc. Metals
471.15	Structural & Misc. Timber
471.16	Siding
471.17	Masonry
471.18	Roofing
471.22	Painting
471.24	Plumbing & Roof Drains
471.25	Space Heating & Ventilation
471.26	Lighting
471.27	Apertures

DEPARTMENT 851 - Pulp Drying Machine

851.11	Excavation and Fill
851.13	Concrete
851.14	Structural & Misc. Metals
851.15	Structural & Misc. Timber
851.16	Siding
851.17	Masonry
851.18	Roofing
851.21	Interior Finishing
851.22	Painting
851.23	Interior Fire Protection
851.24	Plumbing & Roof Drains
851.25	Space Heating & Ventilation
851.26	Lighting
851.27	Apertures

MATERIAL COST CODES

Civil and Structural Items - DETAILS

DEPARTMENT 891 - Pulp Warehouse

891.11	Excavation
891.13	Concrete
891.14	Structural & Misc. Metals
891.15	Structural & Misc. Timber
891.16	Siding
891.17	Masonry
891.18	Roofing
891.22	Painting
891.23	Interior Fire Protection
891.24	Plumbing & Roof Drains
891.25	Space Heating & Ventilation
891.26	Lighting
891.27	Apertures

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items

Category	Department		Detail	Description
X	VVV	.	YY	
E	---	.	--	Electrical
N	---	.	--	Instrumentation
P	---	.	--	Piping
Q	---	.	--	Equipment
	111	.		Site
	121	.		Transportation
	131	.		Sewers
	132	.		Effluent Treatment
	141	.		Fire Protection
	211	.		Offices, Laboratories and Personnel Services
	221	.		Mill Stores
	231	.		Maintenance Shops
	261	.		Fuel Storage & Handling
	271	.		Water Supply & Distribution
	272	.		River Pumphouse & Pipelines
	281	.		Steam Supply & Distribution
	291	.		Power Supply & Distribution
	311	.		Wood Yard
	321	.		Wood Room
	322	.		Chip Screening
	411	.		Digester Plant
	421	.		Washing & Screening Plant
	431	.		Bleach Plant
	451	.		Evaporator Plant
	461	.		Recovery Boiler Plant
	471	.		Causticizing Plant
	481	.		Lime Reburning Plant
	621	.		Chlorine Dioxide Plant
	851	.		Pulp Drying Machine
	871	.		Finishing Plant
	891	.		Pulp Warehouse

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items

DETAILS

DEPARTMENT 121 - Transportation

	Description
121.41	Motors
121.43	Motor Starters
121.44	Power Wiring
121.53	Road Vehicles
121.54	Service Plant
121.55	Mobile Equipment
121.56	Truck Scale
121.63	Yard Engine

DEPARTMENT 132 - Effluent Treatment

132.31	Pumps and Agitators
132.32	Tanks and Fittings
132.34	Pipe, Valves and Fittings
132.36	Cranes, Hoists and Elevators
132.37	Material Handling
132.38	Process Controls
132.41	Motors
132.43	Motor Starters
132.44	Power Wiring
132.45	Variable Speed Drives
132.55	Sludge Dewatering
132.61	Chemical Feed Systems
132.67	Mechanical Screens
132.71	Effluent Treatment
132.72	Aerators
132.82	Clarifier

DEPARTMENT 141 - Fire Protection

141.31	Pumps and Diesel Engines
141.32	Tanks and Fittings
141.34	Pipes, Valves and Fittings
141.41	Motor
141.43	Motor Starters
141.44	Power Wiring
141.51	Hydrants
141.52	Hose and Fittings
141.59	Alarm System

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items - DETAILS

DEPARTMENT 211 - Offices, Laboratories, and Personnel Services

211.36	Cranes, Hoists & Elevators
211.41	Motors
211.43	Motor Starters
211.44	Power Wiring
211.51	Office Equipment
211.52	Cafeteria Equipment
211.62	Laboratory Equipment
211.71	First Aid Equipment
211.72	Locker Room Equipment

DEPARTMENT 221 - Mill Stores

221.41	Motors
221.43	Motor Starters
221.44	Power Wiring
221.51	Bins, Cupboards & Racks
221.61	Pallets
221.63	Hand Trucks
221.71	Electrical Spares
221.72	Mechanical Spares

DEPARTMENT 231 - Maintenance Shops

231.36	Cranes, Hoists & Elevators
231.41	Motors
231.43	Motor Starters
231.44	Power Wiring
231.51	Machine Tools
231.52	Hand Tools and Supplies
231.53	Benches and Tables
231.58	Suctioner Box Conditioner
231.59	Roll Dringer

DEPARTMENT 261 - Fuel Storage and Handling

261.31	Pumps and Agitators
261.32	Tanks and Fittings
261.34	Pipe, Valves and Fittings
261.35	Insulation
261.38	Process Controls
261.41	Motors
261.43	Motor Starters
261.44	Power Wiring
261.51	Oil Heaters
261.53	Strainers
261.92	Safety Devices

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items - DETAILS

DEPARTMENT 271 - Water Supply and Distribution

271.31	Pumps and Agitators
271.32	Tanks and Fittings
271.34	Pipe, Valves and Fittings
271.36	Cranes, Hoists and Elevators
271.38	Process Controls
271.41	Motors
271.43	Motor Starters
271.44	Power Wiring
271.61	Filtration Plant
271.62	Coagulation Equipment
271.63	Chlorination Equipment
271.92	Safety Devices

DEPARTMENT 272 - Water Pumphouse

272.31	Pumps
272.32	Tanks and Fittings
272.34	Pipe, Valves and Fittings
272.35	Insulation
272.36	Cranes, Hoists and Elevators
272.38	Process Controls
272.41	Motors
272.43	Motor Starters
272.44	Power Wiring
272.52	Intake Screens

DEPARTMENT 281 - Steam Supply and Distribution

281.31	Pumps and Agitators
281.32	Tanks and Fittings
281.34	Pipe, Valves and Fittings
281.35	Insulation
281.37	Material Handling
281.38	Process Controls
281.41	Motors
281.43	Motor Starters
281.44	Power Wiring
281.51	Boilers
281.54	Air Heaters
281.55	Soot Blowers
281.56	Dust Collector
281.58	Stacks, Breeching and Ductwork
281.59	Fans
281.71	Feedwater Treatment
281.72	Deaerator
281.74	Chemical Injection Equipment
281.81	Air Compressors
281.83	Auxiliary Drives
281.92	Safety Devices

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items - DETAILS

DEPARTMENT 291 - Power Supply and Distribution

291.31	Pumps and Agitators
291.32	Tanks and Fittings
291.34	Pipe, Valves and Fittings
291.35	Insulation
291.36	Crane, Hoists and Elevators
291.38	Process Controls
291.41	Motors
291.43	Motor Starters
291.44	Power Wiring
291.52	Main Switchgeat
291.53	Load Substations
291.54	Distribution Cabling
291.55	Standby Substation
291.56	Lighting Distribution
291.57	Communications and Signalling
291.83	Auxiliary Drives
291.91	Turbo-Generator
291.92	Safety Devices
291.95	Emergency Power Supply

DEPARTMENT 311 - Wood Yard

311.31	Pumps
311.41	Motors
311.43	Motor Starters
311.44	Power Wiring
311.51	Truck Unloading
311.63	Log Lift Trucks
311.81	Chip Loaders

DEPARTMENT 321 - Wood Room

321.31	Pumps and Agitators
321.32	Tanks and Fittings
321.34	Pipe, Valves and Fittings
321.35	Insulation
321.36	Cranes, Hoists and Elevators
321.37	Material Handling
321.38	Process Controls
321.41	Motors
321.42	Excitation Units
321.43	Motor Starters
321.44	Power Wiring
321.50	Wood Room Equipment
321.56	Drum Barkers
321.58	Heat Exchanger
321.63	Bark Hog
321.64	Refuse Treatment
321.65	Hoppers and Sluices
321.71	Chippers
321.72	Chip Feeders
321.79	Knife Grinder
321.82	Pneumatic Conveying System
321.92	Safety Devices

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items - DETAILS

DEPARTMENT 322 - Chip Screening

322.31	Pumps and Agitators
322.37	Material Handling
322.38	Process Controls
322.41	Motors
322.43	Motor Starters
322.44	Power Wiring
322.45	Variable Speed Drives
322.71	Chippers
322.72	Chip Feeders
322.73	Chip Screen
322.77	Magnetic Separator
322.82	Pneumatic Conveying System

DEPARTMENT 411 - Digester Plant

411.31	Pumps and Agitators
411.32	Tanks and Fittings
411.34	Pipe, Valves and Fittings
411.35	Insulation
411.36	Cranes, Hoists and Elevators
411.37	Material Handling
411.38	Process Controls
411.41	Motors
411.43	Motor Starters
411.44	Power Wiring
411.45	Variable Speed Drives
411.51	Digester
411.57	Blow Tank
411.58	Heat Recovery
411.71	Turpentine Recovery
411.92	Safety Devices

DEPARTMENT 421 - Washing and Screening Plant

421.31	Pumps and Agitators
421.32	Tanks and Fittings
421.33	Tank Linings
421.34	Pipe, Valves and Fittings
421.35	Insulation
421.37	Material Handling
421.38	Process Controls
421.41	Motors
421.42	Excitation Units
421.43	Motor Starters
421.44	Power Wiring
421.45	Variable Speed Drives
421.51	Knotters
421.52	Washers
421.54	Process Heating & Ventilating
421.57	Refiners
421.58	Drainer
421.61	Screens

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items - DETAILS

DEPARTMENT 431 - Bleach Plant

431.31	Pumps and Agitators
431.32	Tanks and Fittings
431.33	Tank Linings
431.34	Pipe, Valves and Fittings
431.35	Insulation
431.36	Cranes, Hoists and Elevators
431.38	Process Controls
431.41	Motors
431.43	Motor Starters
431.44	Power Wiring
431.45	Variable Speed Drives
431.51	Mechanical Equipment
431.52	Washers
431.53	Scrubbers
431.54	Process Heating and Ventilation
431.58	Heat Exchangers
431.81	Chlorine Handling Equipment
431.84	Sulphur Dioxide Handling Equipment
431.92	Safety Devices

DEPARTMENT 451 - Evaporator Plant

451.31	Pumps and Agitators
451.32	Tanks and Fittings
451.34	Pipe, Valves and Fittings
451.35	Insulation
451.38	Process Controls
451.41	Motors
451.43	Motor Starters
451.44	Power Wiring
451.51	Evaporator
451.92	Safety Devices

DEPARTMENT 461 - Recovery Boiler Plant

461.31	Pumps and Agitators
461.34	Pipe, Valves and Fittings
461.35	Insulation
461.36	Cranes, Hoists and Elevators
461.38	Process Controls
461.41	Motors
461.43	Motor Starters
461.44	Power Wiring
461.51	Boiler
461.54	Air Heaters
461.55	Soot Blowers
461.56	Precipitator
461.58	Stacks, Breeching and Ductwork
461.59	Fans
461.63	Liquor Heaters
461.83	Auxiliary Drives
461.92	Safety Devices

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items - DETAILS

DEPARTMENT 471 - Causticizing Plant

471.31	Pumps and Agitators
471.32	Tanks and Fittings
471.34	Pipe, Valves and Fittings
471.35	Insulation
471.38	Process Controls
471.41	Motors
471.43	Motor Starters
471.44	Power Wiring
471.52	Causticizing Equipment
471.92	Safety Devices

DEPARTMENT 481 - Lime Reburning Plant

481.31	Pumps and Agitators
481.32	Tanks and Fittings
481.34	Pipe, Valves and Fittings
481.35	Insulation
481.37	Material Handling
481.38	Process Controls
481.41	Motors
481.43	Motor Starters
481.44	Power Wiring
481.45	Variable Speed Drives
481.51	Mud Centrifuge
481.52	Lime Kiln
481.53	Kiln Lining
481.54	Fuel Burning Equipment
481.55	Dust Recovery Equipment
481.56	Stack and Ducts
481.57	Crusher
481.59	Carbon Dioxide Fan
481.81	Carbon Dioxide Cooling Tower
481.92	Safety Devices

DEPARTMENT 621 - Chlorine Dioxide Plant

621.31	Pumps and Agitators
621.32	Tanks and Fittings
621.33	Tank Linings
621.34	Pipe, Valves and Fittings
621.35	Insulation
621.37	Material Handling
621.38	Process Controls
621.41	Motors
621.43	Motor Starters
621.44	Power Wiring
621.51	Chlorine Dioxide Generating Equipment
621.61	Chiller
621.92	Safety Devices

MATERIAL COST CODES

Electrical, Instrumentation, Piping and Equipment Items - DETAILS

DEPARTMENT 851 - Pulp Drying Machine

851.31	Pumps and Agitators
851.32	Tanks and Fittings
851.33	Tank Linings
851.34	Pipe, Valves and Fittings
851.35	Insulation
851.36	Cranes, Hoists and Elevators
851.38	Process Controls
851.41	Motors
851.42	Excitation Units
851.43	Motor Starters
851.44	Power Wiring
851.45	Cariable Speed Drives
851.51	Pulpers
851.52	Machine Screens
851.53	Centrifugal Cleaners
851.55	Thickeners
851.61	Stock Inlet
851.62	Fourdrinier
851.64	Presses
851.67	Dryer
851.73	Pulp Machine Drive
851.75	Condensate System
851.76	Lubrication System
851.77	Machine Ventilation and Heat Recovery
851.78	Heat Exchangers
851.79	Vacuum System
851.92	Safety Devices

DEPARTMENT 871 - Finishing Plant

871.34	Pipe, Valves and Fittings
871.38	Process Controls
871.41	Motors
871.43	Motor Starters
871.44	Power Wiring
871.56	Scales
871.60	Bale Finishing System
871.62	Testing Equipment
871.64	Cutter and Layboy
871.67	Hydraulic Presses
871.68	Typing Machines

DEPARTMENT 891 - Pulp Warehouse

891.38	Process Controls
891.43	Motor Starters
891.44	Power Wiring
891.51	Lift Trucks
891.52	Blocking for Bale Storage

PROCTER & GAMBLE GRANDE PRAIRIE PULP MILL

JOB 9103

DISTRIBUTABLE MATERIAL CODE OF ACCOUNTS

	Temporary Buildings
Y-X11.10	Main Field Office
Y-X11.20	Area Field Office
Y-X11.30	Maintenance Shed
Y-X11.40	All Other Buildings
	Temporary Work Areas and Bays
Y-X12.10	Work Areas in Permanent Warehouse
Y-X12.20	Water & Oil Tank Shelter & Miscellaneous Work Shelters
Y-X12.30	Gravel Construction Areas
Y-X13.00	Temporary Roads & Parking
Y-X14.00	Temporary Railroad Facilities
	Temporary Power, Light & Telephone
Y-X15.10	Power, Light & Telephone
Y-X15.20	Parking Lot Car Heaters
Y-X15.30	Main Power Supply to Project
	Temporary Air, Water & Sewage
Y-X16.10	Water, Air & Sewage
Y-X16.20	Temporary Fire Portection
	Minor Temporary Construction
Y-X17.10	Gang Boxes, Safety Barricades, etc.
Y-X17.20	Provide for Winter Protection
Y-X18.00	General Scaffolding, Cribbing & Dunnage
Y-X22.00	Maintenance of Tools & Equipment
Y-X23.00	Material Handling
Y-X24.00	Welders Tests/Training
Y-X25.00	Watchmen and Guards
Y-X27.00	On and Off Expense
Y-X28.00	Surveying

Construction Equipment

Y-X31.10	Bechtel Equipment Rental
Y-X31.20	Third Party Equipment
Y-X31.30	Purchased Equipment

Small Tools

Y-X32.10	Purchased Tools
Y-X32.20	Rental Tools
Y-X32.30	Freight on Tools and Equipment

Consumables

Y-X33.10	Fuels & Lubricants
Y-X33.20	Other
Y-X33.30	Testing for Soils & Concrete

Purchased Utilities

Y-X34.10	Natural Gas & Propane
Y-X34.20	Power

Field Office Costs

Y-X41.00	Supervision (Non-Manual only)
Y-X42.00	Engineering
Y-X43.00	Administration
Y-X44.00	Warehousing & Purchasing
Y-X45.00	First Aid Medical & Salary
Y-X45.10	Non-Manual Guards
Y-X46.00	Non-Manual V, S, H & S/R

Field Office Overhead

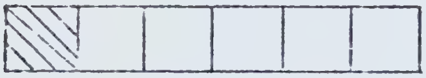
Y-X47.10	Office & Supplies
Y-X47.20	Telephone, Telegraph & Postage
Y-X47.30	Office Furniture & Equipment
Y-X47.40	Computer Charges
Y-X47.50	Methods Program Costs

Non-Manual Allowance Travel & Relocation

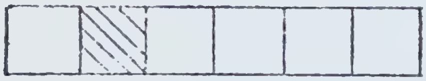
Y-X48.10	Travel, Travel Pay & Settling in Expense
Y-X48.20	Shipment of Household Goods
Y-X48.30	Non-Manual Living Allowance
Y-X48.40	Non-Manual Business Travel
Y-X48.50	Non-Manual Housing Procurement

	Backcharge Recovery
Y-X49.10	Construction Equipment
Y-X49.20	Small Tools & Consumables
Y-X49.30	Supervision & Indirect Costs
Y-X49.40	Payroll Taxes & Insurance
Y-X49.50	Board & Lodging
Y-X50.00	Maintaining Production
	Project Taxes & Insurance
Y-X61.00	Payroll Taxes
Y-X62.00	Insurance
Y-X62.10	Prepayment of Workmen's WCB Assessment, etc.
Y-X63.00	Insurance - Material & Equipment
	Manual Fringe Benefits
Y-X64.10	Travel In and Out
Y-X64.20	Bus Transportation
Y-X64.30	Subsistence
Y-X64.40	Daily Travel Pay
Y-X70.00	Camp Costs
Y-X91.00	Incidental Overtime
Y-X92.00	Building Permits
Y-X93.00	P & G Overhead (Non Fee)
Y-X94.00	

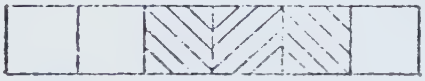
PROGRAM FOR USING ALPHA/NUMERIC
LABOR COST CODE



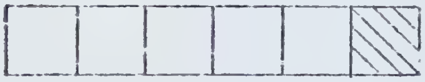
First character denotes area



Second character denotes category



Third, fourth and fifth characters denote work order.



Last character denotes craft

Sample:

1	P	1	8	5	P

Area 1 - Piping - Work Order - Pipefitters

P & G GRANDE PRAIRIE PULP MILL

Job 9103

CODE OF ACCOUNTS

Area Identification

Area	Sandwell Dept. No.	Department
1		Power & Recovery Boiler Bldg.
	281	Steam Supply & Distribution
	291	Power Supply & Distribution
	451	Evaporator Plant
	461	Recovery Boiler Plant
	471	Causticizing Plant
	481	Lime Burning Plant
2		Pulp Making Building
	411	Digestor Plant
	421	Washing & Screening Plant
	431	Bleach Plant
	621	Chlorine Dioxide Plant
3		Pulp Drying & Finish Plant Bldg.
	211	Offices, Labs, & Personnel Fac.
	221	Mill Stores
	231	Maintenance Shops
	851	Pulp Drying Machine
	871	Finishing Plant
	891	Pulp Warehouse
4		Offplot
	111	Site
	121	Transportation
	131	Sewers
	132	Effluent Treatment
	141	Fire Protection
	261	Fuel Storage & Handling
	271	Water Supply & Distribution
	272	River Pumphouse
	311	Wood Handling & Storage
	321	Wood Preparation Plant
	322	Chip Screening Plant
7	( )	Distributables

Note: Distributables charged to Area 7 are those costs not directly chargeable to Areas 1 - 4 and will be spread at a later date, e.g. 7-Y-911L

Distributables identified to an Area will be charged directly to that Area, e.g. 1-Y-911L.

CATEGORY

B - Buildings

E - Electrical

F - Equipment Structures, and Foundations

N - Instrumentation

P - Piping

Q - Equipment

S - Site Clearance, Yard and Underground

T - Field Instructions

U - Pre-Start-up Inspection

W - Vendor Back-charges

Y - Distributables

Note: It is possible to add additional categories when future needs require. However, the FOCUS program needs to be slightly modified to handle additional categories.

Examples may be:

- Pollution control could be designated by a category in order to isolate all labor costs associated with it.
- If the number of field instructions exceed the number of available work orders in the "T" category, a new catefory could be created to handle the overflow.

See Attachment No. 1 for a detailed description of each category.

WORK ORDERS

Under the proposed Work Order system the first three hundred Work Orders will be designated for typicalc, common items of direct account work. These typical items are common throughout all the four areas and will be work ordered according to the following number sequences:

	Work Order Numbers
Concrete - Excavation, foundation and grade beam	001-019
Concrete - Structural	020-039
Concrete - Slabs at grade	040-049
Concrete - Elevated slabs & beams	050-059
Concrete - Other	060-069
Miscellaneous Iron	070-089
Underground sewers (RCP, VCP, FRP)	090-099
Power and Control Equipment	100-104
Lighting and equipment fixtures	105-114
Cable Tray	115-119
Building Lighting Circuits	120-129
5 KVA Wire	130-139
Instrument Tubing - single & Multi	140-149
Instruments	150-159
Scaffolding - Electrical	161
- Instrumentation	162
- Piping	163
- Equipment	164
Piping - Install A/G Carbon Steel	170-189
Piping - Install A/G Alloy	190-209
Piping - Install A/G F.R.P.	210-214

	Work Order Numbers
Piping - Install A/G Speciality	215-219
Piping - Test All A/G	220-224
Piping - Install Major Hangers	225-229
Piping - Install Minor Hangers	230-234
Piping - Steam Tracing	235-240

Work orders No's. 241 - 299 will be reserved for future items that will be designated as typical items or for any over-runs that might occur in the above blocks.

All remaining work orders (i.e. No's. 300 - 899) will be available for use in every category.

A Description of each of the typical items is found in Attachment No.

CRAFT

B - Boilermakers

C - Carpenters

D - Cement Masons

E - Electricians

F. - Ironworkers/Structure

G - Ironworker/Rebar

L - Labourers

M - Millwrights

P - Pipefitters

T - Teamsters

W - Operating Engineers

X - Painters

Y - Others

ATTACHMENT # 2

DESCRIPTIONS OF COMMON WORK ORDERS

Work Order Block

001 - 019

Foundation and Grade Beam Concrete

- Includes all concrete foundations, trenches, pits, basins and walls not rising more than feet above grade, and associated earthwork.

Includes
- Excavation and backfill
- Formwork (including stripping)
- Rebar/mesh
- Anchor bolts
- Embedded metal
- Concrete finishing and curing

Excludes:
- Concrete valve pits, pipe anchors and thrust blocks,
- Concrete envelopes for underground electrical conduit banks.

020 - 039

Structural Concrete

- Includes all concrete structures, columns, piers, walls rising more than feet above grade and combination steel and concrete structures. Also included are any precast concrete structures.

Includes:
- Formwork (including stripping)
- Reinforcing steel
- Anchor bolts and embedded metal
- Concrete finishing and curing.

040 - 049

Concrete - Slabs at Grade

- Includes all concrete for all slabs either at grade or at a raised grade and being considered a grade slab.

Includes:
- Earthwork for bringing ground to grade.
- Formwork (including stripping)
- Reinforcing steel/mesh
- Saw cut joints and joint material
- Concrete finishing and curing.

050 - 059

Concrete - Elevated Slabs and Beams

- Includes all concrete for elevated slabs and beams

Includes:
- Formwork (including stripping)
- Reinforcing steel/mesh
- Embedded inserts
- Finishing and curing.

060 - 069

Concrete - Other

- All structural and foundation not included in preceding descriptions.

Work Order Block

070-089 Miscellaneous Iron

- includes the erection of all grating, checkered floor plate, toe plate, stairs, ladders, handrails.

  Excludes: Pipe hangers and supports installed normally by pipefitters.
  Minor electrical supports by electricians.

090-099 Underground Sewers

- includes earthwork for sewer lines, installation of sewer pipe, valves, and testing. Also includes all earthwork and concrete for valve boxes, pipe anchors and thrust blocks.

100-104 Power and Control Equipment

- includes all switchgear and transformers (excludes the main power source), motor control centres, local controls and push buttons.

  Excludes: All power and control equipment associated with any building electrical circuit.

105-114 Lighting Equipment and Fixtures

- includes all lighting switchgear, panels transformers. Lighting fixtures include all recepticles, switches, lamps for fixtures, and area flood light poles complete with footings and out reach arms.

  Excludes: All lighting equipment and fixtures associated with building electrical circuits.

115-119 Cable Tray

- includes all cable tray and their supports when added specifically for cable trays.

120-129 Building Electrical Circuits

- Includes all electrical circuits associated with building electrical services and lighting. It includes all circuits from but not including the building feeder power source, through the distribution panels, local controls, or push buttons to and including any building lighting, recepticles, fixtures, or other apparatus associated with the building electrical services.

  NOTE: This block of work orders is only to be used in the Building "B" category.

Work Order Block	
130-136	Cable - 5 KV and over - Power - includes all wire and cable with 5 KV and over insulation. Includes all connections.
137-139	Grounding System - includes wire and cable, cadweld and clamp connections, grounding rods, ground wells, copper ground plates, trenching and backfill for the grounding system.
140-149	Instrument Tubing, Single & Multi - includes installation of all pneumatic signal transmission tubing and multi-tube bundles including connectors, fittings, manual valves, junction boxes, raceway and raceway supports. Includes the connection of tubing to control panel bulkheads.

Work Order Block	
150 -159	Instruments - includes installation of instruments that are a part of an instrument loop or are a local instrument. Includes all piping and tubing items after the first block valve on a process stream or vessel.
161	Scaffolding - Electrical - includes the erection, moving and dismantling of all scaffolding used in the electrical work operations.
162	Scaffolding - Instrumentation - includes the erection, moving and dismantling of all scaffolding used in the instrumentation work operations.
163	Scaffolding - Piping - includes the erection, moving and dismantling of all scaffolding used in the piping work operations.
164	Scaffolding - Equipment - including the erection, moving and dismantling of all scaffolding used on all equipment installation work operations.
170-189	A/G Carbon Steel Piping - includes moving all materials from the storage area/ warehouse to the general area of use, and installation including: erecting, re-fabricating, cutting, threading, make-up of joints and seal welding, pre-heating and stress relieving, welding, bolting-up.
190-209	A/G Alloy Pipe - includes moving all materials from the storage area/ warehouse to the general area of use plus erecting, re-fabricating, welding, and/or bolting-up, and stress relieving (if required).
210-214	A/G Fiberglass Reinforced Pipe - includes moving all materials from the storage area, warehouse to the general area of use and installation including: preparing the joint surface and wrapping.
215-219	A/G Speciality Pipe - includes any above ground process piping not included

Work Order Block

215 - 219 A/G Specialty Pipe (cont'd.)

- in the preceding three categories. Includes moving all materials from the storage area/warehouse to the general area of use, plus erecting, re-fabricating, welding and/or bolting-up, and stress relieving (if required).

220-224 Testing A/G Process and Utility Pipe

- includes all hydrostatic service or air testing plus the installation and removing of the temporary screens, blinds and spacers.

225-229 Major Hangers and Supports - A/G Pipe

- includes the fabricating, re-fabrication and installation of major pipe hangers and supports.

- Major hangers are those sophisticated enough to be covered by an engineering design.

230-234 Minor Hangers and Supports - A/G Pipe

- includes the fabricating, re-fabricating and installation of minor pipe hangers and supports.

- Minor hangers are considered as simple guides and supports.

235-240 Steam Tracing - Piping

- includes the installation costs for steam tracing piping. Steam tracing starts with and includes the tracer takeoff from a steam header or sub-header, the actual tracer, the line from the actual tracer to the steam trap, and the line returning the condensate from the steam trap to a drain or the condensate header.

DISTRIBUTABLE WORK ORDERS

The Distributable work orders will be written for individual area wherever feasible. In cases where costs cannot be distinguished by area they will be work ordered for the entire job, to be designated by Area 7.

The work orders for distributables will be pre-numbered as follows:

Work Order Number	Description
900-909	Temporary Buildings (including) Main Field Office Area Field Offices All other buildings (temporary)
910-914	Temporary work areas and bays Gravel construction area
915-919	Temporary roads and parking Temporary R.R. facilities
920-924	Temporary Power, Light, Telephone Parking Lot electrical system
925-929	Temporary air, water, sewage
930-939	Minor temporary construction Winter protection
940-944	General/final clean-up
945-949	Maintenance of tools and equipment
950-964	Material handling
965-969	Welders training and testing
970-974	Unallocated Service labour
975-979	On-Off expense
980-984	Surveying
985-989	Show-up time
990	General Foremen
991	General Purpose Scaffolding
992	Travel in and out
993-999	Other Items

DISTRIBUTABLE FIELD WORK ORDERS

Work Order Block	
900-909	Temporary Buildings Includes temporary building structures, lighting, heating, ventilating, plumbing, built-in racks, cabinet work, etc. Piping and wiring inside a building to a point five feet outside the building line are charged to that building; beyond that point they are charged to Temporary Piping and Wiring accounts. In general, separate accounts will be used for the larger temporary buildings such as job office buildings, warehouse, change houses, etc.
910-914	Temporary Working Areas and Bays Includes clearing, excavating, grading, surfacing or surface treatment for temporary facilities, appurtenant enclosure fencing, shelters, work tables, benches, shelves, racks, monorails, etc. Totally enclosed housing structures are charged to Temporary Buildings Account. All piping and wiring serving working areas shall be charged to Temporary Piping and Wiring accounts. In general, separate accounts will be used for major work areas, such as welding bays, carpentry shed, precasting slabs, etc.
915-919	Temporary Roads, Walks, Parking Areas and Fences Includes finish grading, base preparation, surfacing, maintenance, removal and temporary drainage installations. When these facilities are to become permanent roads, parking areas, etc. in the finished plant they are charged to the appropriate direct account; only costs of maintenance during consturction, and of such work not normally required for the permanent facility, shall be charged to this account. General fencing includes temporary job site perimeter fencing and such other temporary fencing which cannot be charged to a work or storage area account.
920-924	Temporary Power, Light and Telephone Facilities Includes main power transformer, low-voltage switchgear, distribution panels, installation and maintenance of welding leads, wire and cable, conduit, poles, switchboards, telephones, intercom systems, signal whistle or siren, and related temporary items. All lighting facilities in temporary buildings, including related panels, shall be charged to the appropriate temporary building accounts.

Work Order Block

925-929 Temporary Water, Air and Sewerage Facilities

Includes distribution system for water, sewerage, steam, air, and welding gases including piping, drinking fountains, water tanks, septic tanks, leaching fields, chemical toilets, etc. Labour for distributing drinking water in barrels or bottles shall be charged to Unallocated Service Labour.

930-939 Minor Temporary Construction

Includes gangboxes, plan sheds, construction and safety signs, barricades and guard rails, stairs, platforms and walkways, construction equipment foundations and any other minor temporary construction items not covered elsewhere.

Winter Protection

All labour to prepare or maintain working areas and equipment for winter work. It would include items as temporary enclosures around open buildings or foundations, or enclosures inside buildings for pouring slabs and placing block. It would also include labour for cleaning and flushing cooling systems and addition of anti-freeze to cooling systems, installation of equipment heaters and lubrication specifically required for cold weather.

940-944 General and Final Job Clean Up

Clean up required for a particular operation shall be charged to the direct account for the operation. Janitor service for temporary buildings shall be charged to Unallocated Service Labour Accounts.

945-949 Maintenance of Tools and Equipment

Includes routine and emergency repairs and upkeep of job-owned and rented equipment; required material, parts, maintenance and cleaning of small tools; fuel truck crew and costs of operating repair shop, including master mechanic and his crew.

950-964 Material Handling

Includes unloading, handling and initial storage and warehousing of permanent construction materials and small tools. Handling from point of storage to point of use shall be charged to direct accounts. All unloading,

Work Order Block

950-964	Material Handling (cont'd.) handling, and storage costs for identifiable equipment, such as pumps, turbines, vessels, etc. shall be charged to the appropriate direct accounts or back-charged to sub-contractor when applicable. All labour charges for manual personnel assigned to the warehouse (including tool crib) will be accumulated in this account.

Work Order Block	
965-969	Welders' Tests and Training Includes all preparatory work such as cutting coupons, setting up bending rig, and all testing time and instruction of welders in new or special welding techniques. Includes the charges of a testing lab if used. Includes all charges associated with a welder's training school.
970-974	Unallocated Service Labour Includes costs of servicing water barrels, lanterns, janitor service for temporary buildings, and pickup truck drivers and operating engineers not assigned to a specific work operator.
975-979	On and Off Expenses Includes costs of unloading, assembling, dismantling, inventory, loading and boxing of construction tools and equipment. This does not include the freight for construction equipment and tools.
980-984	Surveying Includes all chainmen, rodmen, instrumentmen, chief-of-party and any others working full-time with the survey crew.
985-989	Show-Up Time Includes show-up time, voting or other labour costs, incurred where craftsmen are paid in accordance with Union or Government regulations without performing any work.
990	General Foremen
991	General Purpose Scaffolding, Cribbing and Dunnage Includes only the receiving and shipping out of scaffolding from the central storage area. When scaffolding is erected for a direct work operation, labour costs shall be charged to the scaffolding account in the directs. (i.e. No's. 160, 161, 162, 163 - see description in common direct accounts). All scaffolding for Field Instructions, Back charges, and change orders shall be charged to the specific account.

JOB No. 9103

DAILY TIME SHEET

CRAFT: REBAR

Date: Sept 10 - 71

Foreman:

Supt.:

Timekeeper:

					NAME AND CLASSIFICATION	J. McCull 5 50		I. CRISTOF 4.50		N. LAUTNE 4.50		M. FELLET 5.00		M. VENTU 4.50		L. LINDSTRO 4.50		W. CURTI 3.90		G FULTO 3.90		M LETEND 4.50		R. GOSSEL 4.50								
					Employee No.	G-08		G-10		G 11		G-19		G 25		G 29		G 35		G 36		G 38		G 41								
WORK ORDER No.					Special Time Rate	6 25						6 25				5 75																
Area	CAT.	WORK ORDER			Work Description	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	S.T.	O.T.	TOTAL
2	B	0	0	3	Place Rebar Block Float mill			8				5		8		4		8		8		6		4								51 ~~45~~
2	B	0	0	4	Cut holes for anchor Bolt plates																	2										2
1	B	0	0	3	Place Rebar Steam & Recovery Plant					8																						8
2	F	0	0	5	Watch Concrete pour. Salt Pit Slab								½											4	½							5
7	Y	9	9	0	General Foreman	⑧	(½)																									8½
2	B	0	0	3	unloading Rebar							③				④																7
					Noon Pour																											
Cost. Engr.					TOTAL	8	½	8		8		8	½	8		8		8		8		8		8	½							80 / 1½

JOB 9103 **LABOR LEDGER** CANADIAN BECHTEL LTD DATE 9/17/71 PAGE 3

W/O NUMBER	CFT	W/O DESCRIPTION	THIS WEEK HOURS S.T.	THIS WEEK HOURS O.T.	THIS WEEK DOLLARS	ADJUSTMENTS HOURS S.T.	ADJUSTMENTS HOURS O.T.	ADJUSTMENTS DOLLARS	TO DATE HOURS S.T.	TO DATE HOURS O.T.	TO DATE DOLLARS
2F003G	IWR	REBAR BLEACH PLT EQUIP FDNS	124.00		631.38				1404.00	33.00	7,911.10
2F003L	LAB	REBAR BLEACH PLT EQUIP FDNS							6.00		27.38
2F003W	O/E	REBAR BLEACH PLT EQUIP FDNS	6.00		35.58				113.00		639.48
2F004C	CAR	EMBEDS BLEACH PLANT EQUIP FDNS	67.00		378.50				470.00	3.00	2,680.29
2F004F	IWS	EMBEDS BLEACH PLANT EQUIP FDNS	3.00		19.76				111.50	6.00	773.02
2F004G	IWR	EMBEDS BLEACH PLANT EQUIP FDNS							132.00	3.00	753.65
2F004L	LAB	EMBEDS BLEACH PLANT EQUIP FDNS							8.00		36.88
2F004W	O/E	NO MASTER RECORD							3.00		18.45
2F005C	CAR	CONCRETE BLEACH PLANT EQUIP FD	13.00	2.00	86.70				335.00	15.00	1,994.69
2F005D	C/M	CONCRETE BLEACH PLANT EQUIP FD	29.00	1.00	157.49				70.00	7.00	401.46
2F005F	IWS	CONCRETE BLEACH PLANT EQUIP FD							4.00		26.31
2F005G	IWR	CONCRETE BLEACH PLANT EQUIP FD							238.00	7.00	1,366.57
2F005L	LAB	CONCRETE BLEACH PLANT EQUIP FD	81.00	7.00	420.55	4.77/h			712.00	23.00	3,395.17 4.62/h
2F005T	TEM	CONCRETE BLEACH PLANT EQUIP FD							39.00		221.96
2F005W	O/E	CONCRETE BLEACH PLANT EQUIP FD							66.00	3.50	377.28
2F009D	C/M	NO WORK ORDER MASTER BOB	4.00		21.63				4.00		21.63
2F302C	CAR	NO WORK ORDER MASTER BOB	77.00		426.25				77.00		426.25
2F302L	LAB	NO WORK ORDER MASTER BOB	16.00		73.76				16.00		73.76
2F303G	IWR	NO WORK ORDER MASTER BOB	22.00		144.44				22.00		144.44
2Y920C	CAR	NO WORK ORDER MASTER BOB	2.00		11.20				2.00		11.20
2Y920E	ELC	TEMP POWER,LIGHT, TELEPHONE	18.00		121.50				62.00		422.82
2Y920W	O/E	TEMP POWER,LIGHT, TELEPHONE							6.00		32.18
2Y925L	LAB	TEMPORARY AIR WATER SEWER							35.00		161.79
2Y925T	TEM	TEMPORARY AIR WATER SEWER							3.00		17.07
2Y925W	O/E	TEMPORARY AIR WATER SEWER							8.00		47.00
2Y930C	CAR	MINOR TEMPORARY CONSTRUCTION	53.00		290.20				207.00	1.00	1,157.59
2Y930L	LAB	MINOR TEMPORARY CONSTRUCTION	9.00		41.49				31.00	1.00	146.43
2Y931F	IWS	NO WORK ORDER MASTER BOB	6.00		39.51				6.00		39.51
2Y940L	LAB	CLEAN-UP	57.50	.50	269.69				310.00	3.50	1,451.91
2Y940T	TEM	CLEAN-UP	12.00		70.29				37.00		214.09
2Y945F	ELC	NO WORK ORDER MASTER BOB	2.00		13.50				2.00		13.50
2Y945L	LAB	NO MASTER RECORD							8.00		37.76
2Y970E	ELC	UNALLOCATED SERVCE LABOR							5.00		34.58
2Y970L	LAB	UNALLOCATED SERVICE LABOR	16.00		74.15				280.50	4.00	1,306.31
2Y970T	TEM	UNALLOCATED SERVICE LABOR							36.00		208.88
2Y980L	LAB	SURVEYING	90.50		427.16				921.50	19.00	4,343.08
2Y980W	O/E	SURVEYING	40.00		226.20				272.00	1.00	1,510.54
		TOTAL AREA	2,306.00	141.00	12,831.77	21.00CR	1.00CR	116.46CR	18,800.50	447.00	101,631.74
3B001C	CAR	EXCV & BFILL PULP WHOUSE FDN							10.00		56.60
3B001L	LAB	EXCV & BFILL PULP WHOUSE FDN	13.00		61.47				833.00	19.00	3,901.04
3B001T	TEM	EXCV & BFILL PULP WHOUSE FDN							406.00	2.00	2,359.70
3B001W	O/E	EXCV & BFILL PULP WHOUSE FDN							644.00	5.00	3,472.05
3B002C	CAR	FAB FORMS PULP WHOUSE FDNS							411.00	2.00	2,336.05
3B002L	LAB	FAB FORMS PULP WHOUSE FDNS							118.00	3.00	552.09
3B002T	TEM	FAB FORMS PULP WHOUSE FDNS							49.00	1.00	284.56
3B002W	O/E	FAB FORMS PULP WHOUSE FDNS							2.00		10.73
3B003C	CAR	INSTL FORMS PULP WHOUSE FDNS	91.00		513.45				2878.00	20.00	16,430.97
3B003D	C/M	NO WORK ORDER MASTER BOB	9.00		47.92				9.00		47.92
3B003F	IWS	INSTL FORMS PULP WHOUSE FDNS							2.00		13.16
3B003L	LAB	INSTL FORMS PULP WHOUSE FDNS	44.00		204.38				1168.00	25.00	5,462.71

DETAILED BUDGET AND TREND FORECAST REPORT

FOCUS RUN

JOB NO. 9103 CUT-OFF DATE 09/17/71

ACCT. NO.	DESCRIPTION OF ACCOUNT	UNITS OF SCOPE	CURRENT BUDGET SCOPE	CURRENT BUDGET MANHOURS	TO-DATE SCOPE	TO-DATE MANHOURS	TREND FORECAST SCOPE	TREND FORECAST MANHOURS	METHOD USED	PERFORMANCE FACTOR TO DATE	PERFORMANCE FACTOR TRND FCST
3B0000	AREA 3-BUILDINGS	PCT	100	179100	0		100	179100	TARGET	1.00	1.00
	*SUBTOTAL WORK-ORDER			179100		0		179100			
3B001C	EXCV & BFILL PULP WHOUSE FDN	MHS	1	1	0	10	1	10	TODATE	1.00	10.00
3B001L	EXCV & BFILL PULP WHOUSE FDN	CY	2540	599	2390	853	2540	906	CURVE-00	1.51	1.51
3B001T	EXCV & BFILL PULP WHOUSE FDN	CY	5263	158	5113	410	5263	421	CURVE-00	2.67	2.66
3B001W	EXCV & BFILL PULP WHOUSE FDN	CY	10508	234	9810	650	10508	696	CURVE-00	2.98	2.97
3B001Z	Z ADJUSTMENT	PANDG		8							
	*SUBTOTAL WORK-ORDER			1000		1923		2033			
3B002C	FAB FORMS PULP WHOUSE FDNS	SF	11031	316	11031	290	11031	290	CURVE-00	.92	.91
3B002L	FAB FORMS PULP WHOUSE FDNS	SF	21008	225	21004	121	21008	121	CURVE-00	.54	.53
3B002T	FAB FORMS PULP WHOUSE FDNS	SF	9977	100	9977	50	9977	50	CURVE-00	.50	.50
3B002W	FAB FORMS PULP WHOUSE FDNS	MHS	1	1	0	2	1	2	TARGET	1.00	2.00
3B002Z	Z ADJUSTMENT	PANDG		58							
	*SUBTOTAL WORK-ORDER			700		463		463			
3B003C	INSTL FORMS PULP WHOUSE FDNS	SF	34219	2195	33967	3017	34219	3039	CURVE-00	1.38	1.38
3B003D			0	0	0	9	0	9	BUDGET	1.00	1.00
3B003F	INSTL FORMS PULP WHOUSE FDNS	MHS	1	1	0	2	1	2	TARGET	1.00	2.00
3B003L	INSTL FORMS PULP WHOUSE FDNS	SF	51902	1245	50452	1194	51902	1228	CURVE-00	.99	.98
3B003T	INSTL FORMS PULP WHOUSE FDNS	SF	17446	175	17250		17448	175	TARGET	1.00	1.00
3B003W	INSTL FORMS PULP WHOUSE FDNS	MHS	1	1	0	21	1	21	TODATE	1.00	21.00
3B003Z	Z ADJUSTMENT	PANDG		17-							
	*SUBTOTAL WORK-ORDER			3600		4243		4474			
3B004C	INSTL RE-BAR PULP WHOUSE FDNS	MHS	1	1	0	2	1	2	TARGET	1.00	2.00
3B004F	INSTL RE-BAR PULP WHOUSE FDNS	MHS	1	1	0	22	1	22	TODATE	1.00	22.00
3B004G	INSTL RE-BAR PULP WHOUSE FDNS	TON	112	930	112	1414	112	1414	CURVE-00	1.52	1.52
3B004L	INSTL RE-BAR PULP WHOUSE FDNS	TON	22	51	22	75	22	75	CURVE-00	1.47	1.47
3B004T	INSTL RE-BAR PULP WHOUSE FDNS	TON	27	3	27	7	27	7	CURVE-00	2.33	2.33
3B004W	INSTL RE-BAR PULP WHOUSE FDNS	TON	59	6	59	30	59	30	CURVE-00	5.00	5.00
3B004Z	Z ADJUSTMENT	PANDG		8							
	*SUBTOTAL WORK-ORDER			1000		1550		1550			
3B005C	CONCRETE PULP WHOUSE FDNS	CY	1632	164	1652	262	1652	262	CURVE-00	1.58	1.57
3B005D	CONCRETE PULP WHOUSE FDNS	SF	28914	588	26114	357	28914	395	CURVE-00	.67	.67
3B005F	CONCRETE PULP WAREHOUSE FDNS	MHS	1	1	0	8	1	8	TODATE	1.00	8.00
3B005G	CONCRETE PULP WHOUSE FDNS	CY	816	122	826	165	826	165	CURVE-00	1.34	1.33
3B005L	CONCRETE PULP WHOUSE FDNS	CY	1632	502	1637	780	1637	780	CURVE-00	1.55	1.54

BECHTEL

JOB 9103
P & G COMPANY OF CANADA
GRANDE PRAIRIE PULP MILL

SUMMARY

DATE: 9/10/71
WORK ORDER NO. 4 B 0 0 1
PLANNER SONNTAG
DEPARTMENT 321

WOODROOM - EXCAVATION & BACKFILL

DESCRIPTION EXCAVATE, BACKFILL, COMPACT, & PREPARE BACKFILL FOR SLAB POUR

SUBCONTRACT ITEMS and QUANTITY: EXCAVATION OF MAJOR PORTION TO BE SUBCONTRACTED TO NORTH AMERICAN V = 7670 cy

REFERENCE DWG'S, SPECS: WOODROOM FND DWGS. 321/701,703,716,706,707

CONSTRUCTION START DATES:
BECHTEL ______ S/C 9/9/71

ESTIMATED COMPLETION DATE:
BECHTEL 7/25/72 S/C 9/17/71

BUDGET: MH ______ $ ______
PROJECTED LABOUR $ ______
ESTIMATED S/C $ ______

DIRECT LABOUR

Craft	Quantity	Scope	Bogey MH's	P.P.F.	Total MH's
W	19,148	CY	305		
L	14,330	CY	2057		
T	6,994	CY	316		
MANHOUR TOTAL			2678		

MATERIAL TO BE FIELD PURCHASED

Qty.	Units	Description	MR No.

NOTE: All other material requirements for this work order have been purchased as noted on the drawings.

SAFETY HAZARDS

—

CONSTRUCTION EQ. & SPECIAL TOOLS

Quantity	Equipment Item	Time Req'd
1	FRONT END LOADER (2½)	1 WK
1	" " " (1 CY)	5 WK
3	TRUCKS	3 WK
1	BULLDOZER	1 WK
1	ROLLER COMPACTOR	2 DAYS
6	COMPACTORS (HAND)	5 WKS.

APPROVALS

Area Supt. BYH
Chief Planner ______
Area Res. Eg. ______
Other ______
Area Engr. ______
Other ______

DISTRIBUTION

Summary Page		Back-up
Proj. Cost Eg.	Field Purc.	Area Supt.
Field Supt.	Safety Eg.	Area Engr.
Chief Planner (2)	Job Engr.	Area Cost Engr.
Eq. Supt.		

JOB 9103
GRANDE PRAIRIE PULP MILL

WORK ORDER BACK-UP SHEET

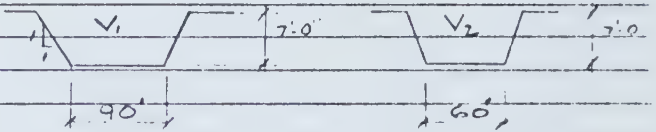
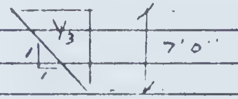
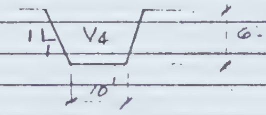
WORK ORDER NO. 4B001

PAGE 1 OF 3

BECHTEL

PREPARED BY: SONNTAG DATE 7/[illegible]
CHECKED: AREA ENGR.: DATE
AREA COST ENGR.: DATE

W. O. DESCRIPTION Woodroom - Excavation & Backfill

Activity Number	WORK DESCRIPTION	CRAFT	QUANTITY	UNIT	Bogey Unit Rate	Total Bogey Fab Shop	Total Bogey Field	CALCULATIONS
	*W.O. is for South Part of							
	Woodroom Only Below 107P							Excavation Volume -
1.	Excavation (N26+65)							
								
	Excavate V1, V2, & V3 -							
	Sidecast to North Area							
	Vol = 7670 CY							
	*Note: Volume is for South							L = 275' L = 36'
	part of [illegible] - ref. 831-701							
(2)	Excavate [illegible] E765							
	@ West Wall Vol = 128 CY							
	1/2 CY Backhoe - Cat	W	128	CY	0.04		5	
	- Oiler	W	128	CY	0.04		5	ENDS
	- Truck	T	128	CY	0.045		6	L = 110'
	- Spotter/Laborer	L	128	CY	0.017		2	
								V1 = 97' × 7' × 275' = 187,000 CF
(3)	Backfill [illegible] :							V2 = 67' × 7' × 36' = 16900 CF
	[illegible] FTGS @ [illegible]							V3 = 7' × 7/2' × 110' = 2700 CF
	Ftg West Wall							Vol = 206600 CF = 7670 CY
	1 CY FEL - Backfill	W	32	CY	0.028		1	
	Tamper - Compact	L	32	CY	0.20		6	West Wall.
(5)	Trim & Shape Excavation	W	1000	CY	0.013		13	
	w/ Grader (Field & St.)							V4 = 16.89' × 6.93' × 30'
								= 3450 CF
								= 128 CY
(4)	Backfill & Compact Soil For							L = 304 Backfill V = 12.67' × 6.88' × 10'
	1/2 3" Below Grade Cut							= 870 CF
	Spread Level - Bulldozer	W	667	CY	0.013		8	= 32 CY
	Compact - Roller	W	667	CY	0.005		3	Grader Volume - Assume 1 FT. Deep
								Over Excavated Area
	Vol = 1000 CY × 8/12 = 667 CY							A = 275 × 90 + 36 × 60 = 26,910 [illegible]
								1000 CY

JOB 9103
GRANDE PRAIRIE PULP MILL

WORK ORDER BACK-UP SHEET

WORK ORDER NO. 4B001

PAGE 2 OF 3

PREPARED BY: SONNTAG DATE 9/10/74
CHECKED: AREA ENGR.: ______ DATE ______
AREA COST ENGR.: ______ DATE ______

W. O. DESCRIPTION WOODROOM - EXCAVATION & BACKFILL

Activity Number	WORK DESCRIPTION	CRAFT	QUANTITY	UNIT	Bogey Unit Rate	Total Bogey		CALCULATIONS
						Fab Shop	Field	
2.	BACKFILL							BACKFILL VOLUME -
(a)	EXTERIOR WALLS							EXCAVATION VOLUME - 7670 CY
								(128 - 32) = 96 CY
	LOAD TRUCK - 2¼ CY F.E.L.	W	2210	CY	0.01		22	Σ = 7766 CY
	HAUL - TRUCK	T	2210	CY	0.045		100	FOUNDATION CONC.
	- SUPP'T LABOR	L	2210	CY	0.017		38	BELOW GRADE = - 433 CY
	(FLD EST.) PLACE - 1 CY F.E.L.	W	2010	CY	0.028		56	(SEE W.O. 4B004)
	(FIELD EST.) HAND PLACE - LABOR	L	200	CY	0.6		120	
	(FLD EST) COMPACT - TAMPERS	L	1470	CY	0.2		294	DRUM BARKER BELOW = - 210 CY
	(FLD EST) COMPACT - 5' ROLLER	W	740	CY	0.005		4	GRADE CONC.
	ASSUME 1/3 (2210) = 740 CY							(SEE W.O. 4B005)
	BY ROLLER							125 + 70 + ($\frac{4.25}{11.75}$) 40
								FEED ċ CHIPPER BIN BELOW
(b)	INTERIOR OF WOODROOM							GRADE VOL. (TO PT. 8'6" W OF E132)
								V = 5.33' × 29' × 5.17' 29.6
	LOAD TRUCK - 2¼ CY F.E.L.	W	4656	CY	0.01		47	+ 1.0' × 29' × 1' 1.1
	HAUL - TRUCK	T	4656	CY	0.045		210	+ 17.5 × 14.33 × 7.17 61.6
	- SUPP'T LABOR	L	4656	CY	0.017		79	+ 3' × 9.33 × 20.0' 20.8
	(FLD EST) PLACE - 1 CY F.E.L.	W	4000	CY	0.028		112	+ 3' × 2.5' × 7' 2.0
	(FLD EST) HAND PLACE - LABOR	L	656	CY	0.6		394	+ 4 × 3.33 × 3.33 × 4.17' 6.8
	(FOR COMPACTION SEE BELOW)							+ 2 × 0.67' × 6.17' × 10.5' 9.1
								+ 1.0' × 1.0' × 13.5' 0.5 = - 127 CY
(c)	FINE GRADE FOR SLAB POUR							
	PREPARATION							CHIPPER FND. (BELOW GRADE CONC.)
								V = 7.0' × 14.83' × 25' = - 96 CY
	BULLDOZER GRADER	W	2900	CY	0.01		29	BLOWER FND. (8% GD.) = 7.16' × 2' = - 8 CY
	FINE GRADE BY HAND	L	322	CY	0.6		193	DRAINSIS FND. (13% GD.)
	COMPACT W/ VIBRATORS	L	4656	CY	0.2		931	V = (7.1' × 12.2' + 9.67' × 37.67') × 1.0' = - 25 CY
								+ 1.0' × 1.0' × 5.5' × 22
	SEE SHT. 3 FOR BULLDOZER							TOTAL BKFILL = 6866 CY
	RATE & LABOR RATE FOR							*HOG FND ċ TRUCK CHIP DUMPER FND.
	GRADING.							TO BE EXCAVATED & BKFILLED ON
								FUTURE W.O.

JOB 9103
GRANDE PRAIRIE PULP MILL

WORK ORDER BACK-UP SHEET

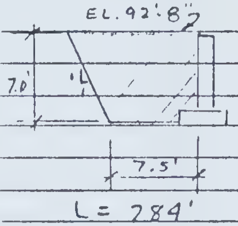
WORK ORDER NO. 4B001

PAGE 3 OF 3

BECHTEL

PREPARED BY: SONNTAG DATE 9/10/71
CHECKED: AREA ENGR.: ____ DATE ____
AREA COST ENGR.: ____ DATE ____

W. O. DESCRIPTION Woodroom - Excavation & Backfill

Activity Number	WORK DESCRIPTION	CRAFT	QUANTITY	UNIT	Bogey Unit Rate	Total Bogey		CALCULATIONS
						Fab Shop	Field	
								BACKFILL VOLUME - (CONT.)
								EXTERIOR BACKFILL VOLUME -
								
								V = (7.5' + 3.5') x 7' x 784'
								+ 10' x 4' x 7' (WALL EAST INSTEP)
								- 1.0' x 1.5' x 784' (FTG)
								= 59500 CF = 2,210 CY
								Σ INTERIOR BKFILL = 6866 - 2210
								= 4656 CY
								BULLDOZER GRADER RATE - FIELD EST.
								RATE = 0.0015/SF
								BOGEY = 0.0015 (19300) = 29 MH'S
								CONVERSION = 29/0.01 = 2900 CY
								11300 + 3500
								GRADE AREA = 75' x 150' + 35' x 100'
								+ 45' x 100' = 19300 SF
								FINE HAND GRADE
								RATE = 0.01/SF
								BOGEY = 0.01 (19300) = 193 MH'S
								CONVERSION = 193/0.6 = 322

BECHTEL

JOB 9103
PROCTER and GAMBLE CO. OF CANADA
GRANDE PRAIRIE PULP MILL

BY:
DATE: 9/16/71

WEEKLY QUANTITY REPORTING SHEET

W. O. DESCRIPTION: WOODROOM - EXCAVATION & BACKFILL COMPACTION & SLAB PREPARATION

WORK ORDER NO. 4 5 0 0 1
DEPARTMENT 321
SHEET 1 OF 2

WORK DESCRIPTION	Craft	Scope	Unit	Unit Rate	Bogey MH's	Quantity Carried Forward	Quantity This Wk. 9/17/71	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	To Date Quantity	Total Installed Quantity
NOTE: W.O. FOR BELOW 107P															
1. EXCAVATION															
(a) DEEP WALL FTGS. @ WEST WALL															
- 1/2 CY BACKHOE	W	128	CY	0.04	5										
- OILER	W	128	CY	0.04	5										
- TRUCK	T	128	CY	0.045	6										
- SUPP'T LABOR	L	128	CY	0.017	2										
(b) BACKFILL MAT'L UNDER ADJAC-															
ENT FTGS. OF (a) - 1 CY FEL	W	32	CY	0.028	1										
- TAMPER	L	32	CY	0.020	6										
(c) TRIM & SHAPE EXCAVATION	W	1000	CY	0.013	13										
w/DOZER															
(d) EXCAV & COMPACTION SOIL															
FOR X" BELOW GRADE S/L CUT															
SPREAD - BULLDOZER	W	667	CY	0.013	8		667								
COMPACT - ROLLER	W	667	CY	0.005	3		667								
2. BACKFILL															
(a) EXTERIOR WALLS															
LOAD TRUCK - 2 1/2 CY FEL	W	2210	CY	0.01	22										
HAUL - TRUCK	T	2210	CY	0.045	100										
- SUPP'T LABOR	L	2210	CY	0.017	38										
PLACE - 1 CY FEL	W	2010	CY	0.028	56										
HAND PLACE - LABOR	L	200	CY	0.6	120										
COMPACT - TAMPERS	L	1470	CY	0.2	294										
- 5' ROLLER	W	790	CY	0.005	4										
(b) WOODROOM INTERIOR															
LOAD TRUCK - 2 1/2 CY FEL	W	4656	CY	0.01	47										
HAUL - TRUCK	T	4656	CY	0.045	210										
- SUPP'T LABOR	L	4656	CY	0.017	79										
PLACE - 1 CY FEL	W	4000	CY	0.028	112										
HAND PLACE - LABOR	L	656	CY	0.6	394										
	▨	▨	▨	▨	-										
TOTAL BOGEY MH'S															

JOB 9103
PROCTER and GAMBLE CO. OF CANADA
GRANDE PRAIRIE PULP MILL

WEEKLY QUANTITY REPORTING SHEET

BY: SONNTAG.
DATE: 5/14/71

W. O. DESCRIPTION: Woodroom –
Excavation & Filling
[illegible] Preparation

WORK ORDER NO. 4 F 0 0 1

DEPARTMENT 721

SHEET 2 OF 2

WORK DESCRIPTION	Craft	Scope	Unit	Unit Rate	Bogey MH's	Quantity Carried Forward	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	Quantity This Wk.	To Date Quantity	Total Installed Quantity
c. Fine Grade for Slab															
Base Preparation															
Bulldozer Grading	W	2900	CY	0.01	29										
Fine Grade by Hand	L	322	CY	0.6	193										
Compact w/ Vibrators	L	1156	CY	0.2	231										
TOTAL BOGEY MH'S	▨	▨	▨	▨											

GRANDE PRAIRIE PULP MILL
ENVIRONMENTAL CONTROL INCREMENTAL COST ESTIMATE
DEFINITION OF TERMS

DEFINED COSTS

Material - Purchased cost delivered to job site.

Labour:

CBL - Basic wage rate, plus union negotiated fringes for employees to be hired directly by CBL.

Subcontract - Lump sum or unit price contract for field labor.

Payroll Taxes & Insurance - Canadian Pension Plan, Unemployment Insurance, Body Injury and property damage, Workmen's Compensation.

Extended Work Week - Premium pay if required to attract labour.

Equipment Rental - Construction equipment required for installation of facilities.

Construction overhead & labour incentives

Temporary Construction Facilities - Temporary facilities for offices and shops, roads and parking lots, power, fence, water, drainage, fire protection.

Miscellaneous Construction Services & Fee - Contractors fee, cleanup, maintenance of tools and equipment, testing welders.

Construction equipment, tools, supplies and Utilities - Small tools, fuels and lubricants, utility cost, and welding supplies.

Non Manual Employees - Supervision, engineering, planning & methods, administration, security force, general foreman.

Field Office Cost - Telephone, telegraph, postage, office furniture & supplies.

Camp, subsistence & bussing - Provide accommodations for manual employees.

Manual travel in and out - Transportation cost and travel pay for manual employees.

Winter protection - Cost of facilities to allow winter work required for schedule.

OTHER COSTS

Contingency

Escalation

Engineering

GRANDE PRAIRIE PULP MILL

ENVIRONMENTAL CONTROL INCREMENTAL COST ESTIMATE

ADDITIVES TO BASE COST

Payroll Taxes & Insurance	9.2% of CBL Labor
Extended Work Week	10% of CBL & subcontract labor
Equipment Rental	Estimated
Construction overhead & labor incentives	
Temporary Construction Facilities	6% of CBL & subcontract labor
Miscellaneous Construction Services & Fee	16% of CBL & subcontract labor
Construction equipment, tools, supplies and Utilities	11% of CBL Labor
Non Manual Employees	31% of CBL Labor
Field Office Cost	6% of CBL & subcontract labor
Camp, subsistence & bussing	30% of CBL & subcontract labor
Manual travel in and out	2% of CBL labor
Winter protection	5% of CBL & subcontract labor
Contingency	4% of preceding total
Escalation	6.8% of preceding total
Engineering	4.6% of preceding total

9/13/71